

NSSM 128

NUCLEAR TEST BAN POLICY REVIEW
EXECUTIVE SUMMARY
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NSSM 128NUCLEAR TEST BAN POLICYEXECUTIVE SUMMARY

The United States has maintained the public position that we would be willing to negotiate a comprehensive ban on nuclear testing if such an agreement could be adequately verified. This policy is manifested in our endorsement of the Limited Test Ban Treaty, the Non-Proliferation Treaty, and in our general support of UN resolutions ^{1/} commending a comprehensive test ban (CTB) as a desirable arms control objective. It has been our position that on-site inspection (OSI) would be a necessary supplement to national means to adequately verify a CTB.

The Soviets also have consistently endorsed a CTB, but have maintained that national means of verification are adequate and have in recent years rejected on-site inspections. Thus, while the U.S. and Soviets publicly agree on the desirability of a CTB, the U.S. - Soviet impasse on verification has served to prevent the negotiation of a treaty.

Recently, there has been an increase in domestic and international pressure to negotiate a CTB, particularly since advances in the technology of seismic (and other) means of detection and identification raise challenges to our insistence upon the need for on-site inspection. Many have declared that these advances in seismology permit us to rely on national means

^{1/} We abstained on all three test ban resolutions in the 1971 UNGA due to what we considered to be unacceptable language.

only for test ban verification.

-- A CTB has become an increasingly important item of discussion in the CCD. Many countries at the Geneva Conference of the Committee on Disarmament (CCD) maintain that a CTB is long overdue and should now be negotiated. Nine non-aligned states have submitted a memorandum stating that the verification problem could be resolved by national means alone, but "supplemented by international means", and calling for the nuclear weapon states to submit proposals in order to initiate negotiations. Japan, Canada and Sweden are leading proponents of further limitations on nuclear testing, and Sweden has tabled a draft CTB treaty. Canada has proposed that the U.S. and USSR table their own draft CTB treaties, but has suggested that signature could be contingent upon French and Chinese adherence. Japan has tabled a proposal for a gradually descending seismic threshold test ban, beginning with an immediate magnitude 5.75 moratorium pending the establishment of an international machinery to supervise observance of a magnitude 5.25 test ban agreement. Under this proposal the threshold would be lowered to at least 4.25 as seismic and other means of verification improve.

-- Some non-nuclear weapon states (NNWS) have asserted that prompt conclusion of a CTB will be necessary to preserve the viability of the Non-Proliferation Treaty. These states claim that a CTB is necessary to balance the non-proliferation obligations assumed by the NNWS under the NPT

There are also states signatory to the NPT but which have not ratified it that might attempt to use the NPT rationale as a lever to pressure for CTB negotiations. The NPT is due for review in 1975, at which time it is possible that the lack of a CTB might provide ostensible justification for some states to withdraw from the NPT. There are differing views as to how valid these threats are. More likely, the NNWS will continue to criticize the nuclear weapons states for failure to conclude a CTB and urge action to do so with increasing stridency. Ratification or withdrawal from the NPT is likely to depend more on other national policy considerations than on a CTB.

-- It is highly probable that the UN General Assembly will continue to pass strongly worded annual resolutions urging negotiation of a CTB.

-- Some scientists and vocal disarmament and environmental group are likely to continue their pressure for a CTB.

There is increasing pressure from some Senators for prompt negotiation a CTB on the grounds that advances in seismic discrimination technology have made verification of an agreement feasible by national means alone. Among the sponsors of resolutions calling for a test ban are several potential presidential candidates (Muskie, Kennedy, McGovern and Humphrey). A CTB may become a 1972 political issue.

-- Our Delegation to the CCD speculated late in 1971 that the Soviets might be considering a new test ban initiative, although it is almost certain that any such initiative would not include a right to mandatory

on-site inspection. However, there has been no specific Soviet initiative to date.

-- If a nuclear test is blamed for environmental mishaps, further domestic and international pressure could arise urging a halt in nuclear testing and perhaps negotiation of a CTB. However, our underground nuclear test program has had an outstanding safety record and has not been generally the focus of severe public criticism. But the high yield CANNIKIN test did raise a public outcry before its detonation. This test also spurred Japanese and Canadian demands for a test ban.

Another reason for examining our current nuclear test ban policy is to determine whether this policy is any longer consistent with our national security interests in light of its interaction with likely SALT agreements and possible future threats. There are those who believe that a test ban would be detrimental to our national security interests and that we should not accept any further restraints on our testing capability at this time. Others believe that a test ban would be in the best interests of our national security and international political relationships.

In view of these considerations, the NSSM 128 study has examined our current policy, alternative test ban proposals and verification means, political aspects and the national security implications of further limitations on nuclear testing for both the U.S. and USSR.

The overriding issue in assessing our nuclear test ban policy is whether or not the mutual cessation of nuclear testing -- or an inter-

mediate restraint on such testing -- will be more -- or less -- advantageous to our national security interests than the continuation of underground testing without new restraints. Since the proper objective of a test ban is to enhance our national security, an assessment of the salient advantages and disadvantages in terms of their impact upon our security should be determinative of our test ban policy. (While recognizing its importance, verification can be treated to some extent as a separate and subordinate issue since it relates mostly to the confidence with which a test ban can be enforced and is relevant only if a decision is made that a test ban is in our national interest.) However, our position on verification-related issues is important in the public domain for justifying decisions either to maintain the status quo or undertake new policies.

Analysis in the NSSM 128 study has focused on two sets of questions:

-- What are the net effects of a CTB on U.S. national security interests relative to the USSR? What are the political and military benefits and disadvantages of a CTB? What risks and uncertainties will we incur as a result of a CTB and will they be greater than if the U.S. and USSR continue nuclear testing? How effectively can we, and the Soviets, attain improved nuclear weapon capabilities and maintain system reliability by alternative means without testing? What would be the military and political effects of less than comprehensive test limitations (e.g., seismic threshold test ban, quota testing limits)? Are there asymmetries favoring either

side that affect the desirability of a CTB? What are the interactions of a CTB with likely SALT agreements?

-- To what extent and confidence can a CTB be verified by national means alone? Additionally -- or alternatively -- what are the efficacy and desirability of various international means of verification?^{1/} What are the limits on our current and potential national capabilities for detection and identification of nuclear detonations? What are the risks and strategic value of clandestine testing to evade a test ban?

Decisions on the issues above should lead to answers to the following policy questions:

-- Should the U.S. seek a comprehensive nuclear test ban?

-- Should the U.S. maintain or modify its public policy concerning a CTB? Particularly, should we continue to insist upon obligatory on-site inspections as a precondition of a test ban, rely upon national means only, or accept some form of cooperative international verification? On the other hand, do we want to advance reasons against negotiating a test ban? Or, should we advance new pre-conditions for a test ban, such as requiring French and Chinese participation?

^{1/} International means are those which involve cooperative pooling and use of selected verification resources such as unmanned seismic observatories, international data sharing, worldwide seismic networks, joint on-site inspections.

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-- Alternatively, should the U.S. pursue some form of intermediate limitation on nuclear testing short of a CTB? (e.g., threshold, quota)?

Arguments for a Comprehensive Test Ban^{1/}

-- A CTB would contribute to the stability of the political and strategic relationship between the US and the USSR by promoting detente.

We do not know whether the Soviets really want a test ban or not. However, a successful test ban negotiation, in which a bilateral US-Soviet negotiation would be central, would have a positive impact on US-Soviet relations. A CTB could contribute to US national security through further involving the Soviets in the process of detente.

However, it does not necessarily follow that a more durable peace will be achieved thereby, that U.S. - Soviet tensions will diminish, or that the nuclear arms race will be significantly curbed--at least in the near future. Nevertheless, many would believe that an important step forward had been taken toward detente, that the momentum for arms control agreements was being maintained, and that progress had been made toward a more stable

^{1/} A less than comprehensive test ban generally would not attain these possible advantage but would demonstrate some U.S.-Soviet willingness to further restrain themselves with regard to nuclear weapons.

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and peaceful world order. A U.S. initiative toward a test ban might strengthen the hand of those within the Soviet power structure who favor accommodations with the U.S. and might lead to greater stability and less antagonism in U.S.-Soviet relations. If the Soviets failed to respond positively to such an initiative, tensions probably would not worsen, although the fears of those who distrust the Soviets would be strengthened.

-- A CTB would prevent the development of new nuclear weapons systems requiring new warheads and thereby would restrain the arms race. If it is perceived that such weapons developments are destabilizing, then a test ban would be a positive step in removing a source of instability. However, other technical means exist to upgrade nuclear weapons systems capabilities -- even within a SALT limit -- without nuclear testing (egs., guidance improvements, booster throw-weight increases, increases in numbers of some existing types of weapons, adaptation of existing warhead designs to new delivery systems). These measures could be destabilizing whether or not there is a test ban.

-- A CTB would enhance U.S. security by reinforcing the effect of the NPT in reducing the likelihood of further nuclear proliferation.

Further proliferation of nuclear weapons could lower the present barrier to the introduction of nuclear weapons into a conflict, make nuclear war "thinkable", and increase the risk of U.S. involvement in a nuclear engagement.

Those states joining a CTB would be barred from using nuclear tests to develop nuclear weapons, and even those not adhering to a CTB would face an additional deterrent to testing imposed by the existence of a widely and strongly supported treaty. Without testing, non-nuclear weapon states would be limited to developing simple fission weapons of uncertain performance.

A test ban could be a factor in facilitating adherence to the NPT by near-nuclear states that have not yet ratified the NPT. However, it is questionable that those states (e.g., India and Israel) that have sought to retain their prerogative to develop nuclear devices would be dissuaded by a CTB and the political climate it would create against nuclear testing, but it would raise the political penalty of a decision to initiate nuclear testing. There is disagreement as to the extent a CTB would increase the inhibitions against nuclear proliferation.

A CTB would satisfy the claim of some non-nuclear weapon states that such a treaty is necessary to preserve the NPT, which they view as discriminatory. A CTB would be seen by many countries as a fulfillment of the LTBT and of Article VI of the NPT, which pledges the nuclear powers to negotiate further nuclear arms limitations.

-- The stronger and more codified international political sentiment opposed to nuclear testing created by a CTB might be of some political restraint on nuclear testing by France and China. However, it is not

expected that France and China would join a CTB in the near future.

-- Would respond to domestic and international concern about the effects on the environment of underground tests, even though these effects have, thus far, been negligible. However questionable the scientific basis may be for some of the environmental concerns, public anxiety is a real factor in determining the political cost of continued testing.

-- Could preserve any Soviet qualitative disadvantages in nuclear weapon technology that may exist, particularly in low yield weapons where US testing experience is much greater, although our knowledge of current Soviet nuclear weapons development is very limited. A CTB could prevent the Soviets from developing future optimized MIRVs for the SS-9, any MIRVing of SS-11 and SLBMs, or optimum warheads for SAM-upgrade or new ABMs. The Soviets may already have warheads suitable to MIRV their ICBMs and SLBMs, for new ABM interceptors and to give some ABM capabilities to their SAMs without more nuclear testing. There is disagreement as to whether the Soviets might encounter nuclear material constraints on extensive MIRVing and ABM capable SAM deployments, if they are forced by a CTB to use existing warheads. It is unlikely that national means of verification could preclude some clandestine Soviet development of new very low yield warheads.

-- Could reinforce SALT to the extent that a CTB would inhibit the Soviets' attaining a viable first-strike counterforce capability and SAM-upgrade

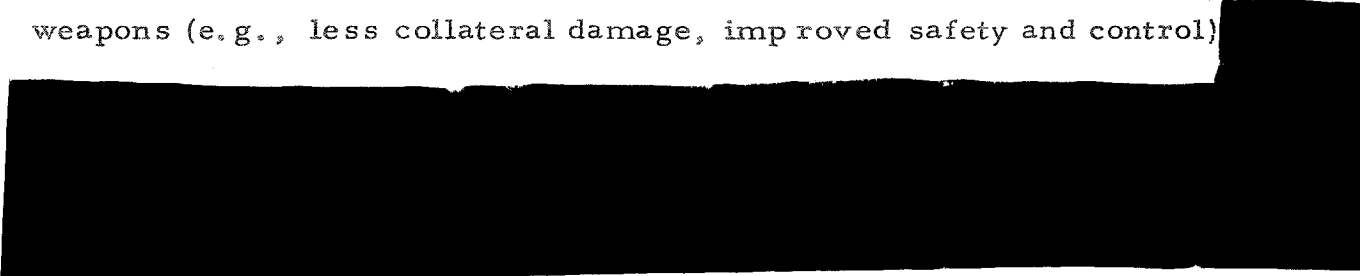
-- Might over the longer term diminish Soviet confidence in the reliability of their nuclear weapons so as to diminish the possibility of their employing a first strike. However, we would not be likely to know if this situation arose.

-- Further restraints on nuclear testing would improve the international political atmosphere. It would remove an irritant in U.S. bilateral relations with Canada and Japan.

-- It would remove one source of fear and discontent believed by many to arise from the postulated dangers of nuclear testing (egs., adverse environmental impact, arms race threats to a stable peace, and contributing to the risks of nuclear war).

Arguments Against a Comprehensive Test Ban ^{1/}

-- We would be denied the capability to identify or develop new nuclear warhead options and thereby constrain our capability to develop or modernize systems in response to future threats. Advanced nuclear weapons technology is currently directed toward attaining such capabilities as improved tactical weapons (e.g., less collateral damage, improved safety and control)



^{1/} A threshold test ban would not be subject to these disadvantages, except for those tests at yield levels that would be prohibited by a threshold limit.

[REDACTED]

Some believe that we have adequate responses using current warhead technology to counter plausible future threats. Moreover, against any serious potential threats adequate US responses involve much more than deployment of improved warhead technology. These non-nuclear technology measures include improvements in accuracy, booster throw-weight, penails, survivability, tactics, larger numbers of certain existing weapons, replacing MINUTEMAN II by MINUTEMAN III with MIRVs, better ASW, and adaptation of existing warheads to new delivery systems. Of these, only the deployment of more strategic missiles would be prevented by our SALT proposal. Others believe that only in the absence of a SALT agreement could the U.S. deploy a sufficient number of options which in combination could overcome all impacts of a CTB on development of needed responses to potential future threats. Without SALT, the U.S. could deploy increased numbers of missiles, some of which could be in mobile basing modes, defend to a significant level the existing silo force and also deploy qualitative improvements such as accuracy and penails. However, the extent effectiveness could be improved by these non-nuclear technology measures as compared to the optimum alternatives postulated through further nuclear testing is uncertain. Moreover, several of these non-nuclear technology measures are likely to be more costly to develop than options possible

with new nuclear warheads. Some believe that these non-nuclear alternatives also may be less reliable than the counters that would continue to be available through testing. They emphasize that it is simply not feasible to predict the nature and character of all possible Soviet threats, and that retrospectively the U.S. test program has proven to be highly effective not only in identifying some possible Soviet advances but in developing suitable counters. Others believe that the combined restrictions of SALT and a CTB would constrain the Soviet threat and thereby reduce the need for these countries.

-- The interaction of a CTB with the probable provisions and exemptions of SALT agreements raise additional concerns over our future security posture:

1. A CTB must be assumed to be of unlimited duration. SALT will constrain our ability to deploy new strategic weapon systems in response to possible future threats. A CTB will add further constraints on our flexibility to respond to these threats. Others note that both SALT and CTB would constrain Soviet threat development while permitting a wide variety of other U.S. responses to unforeseen threats. Moreover, both SALT and CTB would contain clauses permitting withdrawal if supreme national interests are seen to be jeopardized. Others believe that such withdrawal clauses, if invoked, would not permit timely responses to Soviet threats -- if perceived.

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2. A need could arise to develop maneuvering RVs (MaRV), to

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RVs as a hedge against the ability of SALT to effectively restrict potential Soviet ABM capability such as ABM-capable radars and SAM-upgrade systems. A CTB would reduce our confidence in [REDACTED]

[REDACTED] and could increase the weight of Ma RV such that the U.S. SLBM force's independent retaliatory capability would be diminished in the face of deployments of these ABM systems in numbers comparable to present SAMs. Some question whether deployments of such numbers of ABM capable SAMs would go undetected or that the Soviets would elect to forego bomber defense to achieve this ABM capability. They also believe that SALT, especially if reinforced by a CTB, would reduce or eliminate the need for MaRVs, and that in any case an adequate MaRV can be built under a CTB.

3. SALT follow-on negotiations may allow the Soviets a slight numerical superiority in strategic nuclear delivery vehicles. Some believe that this asymmetry will require U.S. strategic systems to depend more heavily upon qualitative improvements in the future, and that these improvements will be more difficult to achieve without a nuclear testing capability. Others believe that these numerical differences would not be strategically significant in the context of the large forces possessed by both sides.

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4. To the extent that a CTB could, in conjunction with SALT, restrict the U.S. options to effectively respond to a Soviet first-strike counterforce development, it could increase the incentive for the Soviets to proceed in such a direction because the feasibility of such an option may appear open to them. However, a CTB could constrain Soviet ability to develop a first strike capability and might diminish their confidence in a first strike strategy.

5. Under a CTB, in conjunction with anticipated SALT restrictions, some potential future Soviet threats (e.g., ICBM - bomber negation, severe ASW, ABM-capable SAM) -- insofar as these threats are not prevented by SALT or could not be countered by responses not restrained by a CTB -- could severely penalize the U.S. ability to maintain strategic objectives


[REDACTED]



Our current policy is to target [REDACTED] targets on a priority basis. Some believe that even if U.S. targeting were to be revised, U.S. assured destruction under a CTB would remain adequate unless virtually all U.S. ICBMs and bombers did not survive a Soviet first strike and SLBM attrition exceeds 30%.

The issue is the selection of a revised strategic policy, to continue ^{forces} to maintain _{to cover} [REDACTED] targets, and to hedge these capabilities against future threats. These alternatives are being considered, among others, in the DPRC Strategic Objectives Study.

-- There are several prospective asymmetries that could favor the USSR under a CTB.

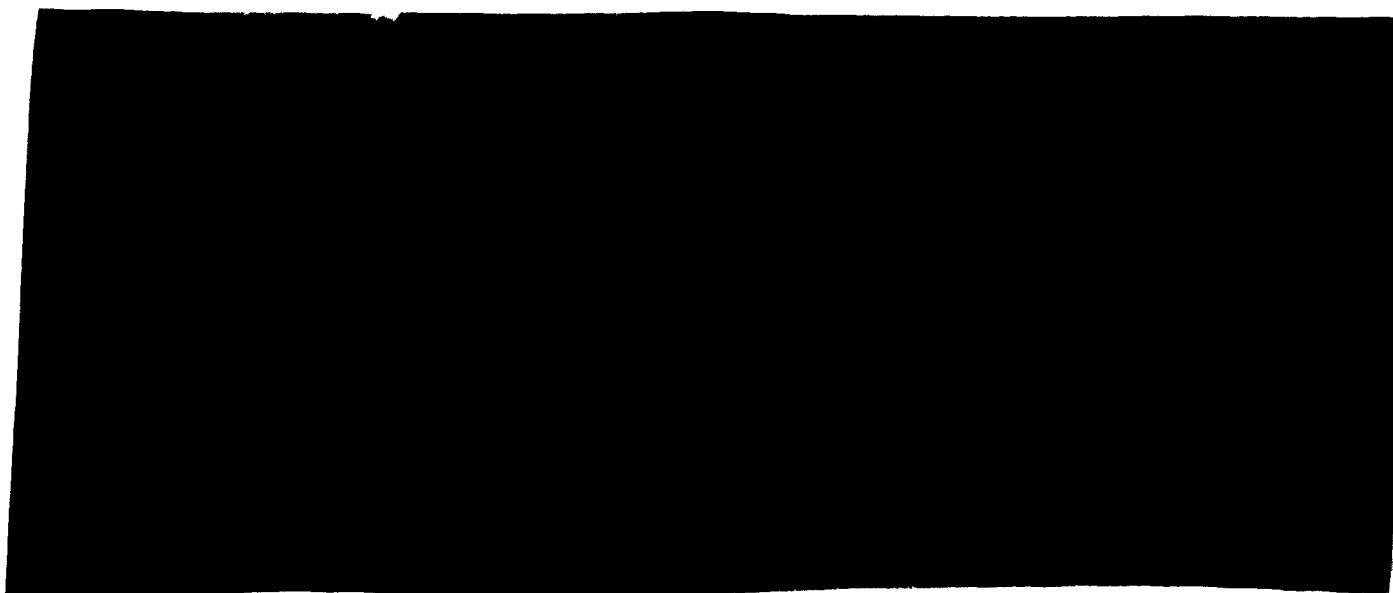
1. The Soviet advantage in SS-9 throw-weight would permit some flexibility to MIRV that missile without requiring nuclear testing. While suitable RV/warhead combinations for MIRVing of the SS-11 and SS-NX-8 have not been seen, the warheads may exist or may be available by the time a CTB went into effect.



2. It might be possible for the Soviets to evade a CTB or plan for abrogation clandestinely on a large-scale basis. The closed nature of Soviet society could allow them to continue very low yield tests even though the U.S. could not. Even the current estimate of the feasible seismic identification threshold is still high enough to allow the Soviets to develop a number of types of very low yield tactical nuclear weapons 
 and probably to conduct some types of weapons effects tests.

-- Vulnerabilities to nuclear effects may exist in current and future U.S. systems which are not known or anticipated, and which can only be discovered or evaluated by nuclear tests.

During the past decade several hidden vulnerabilities have been explored and evaluated through nuclear testing, which, if not corrected, would have caused serious problems with performance of delivery systems, warheads, launch facilities and command control systems in a nuclear environment.

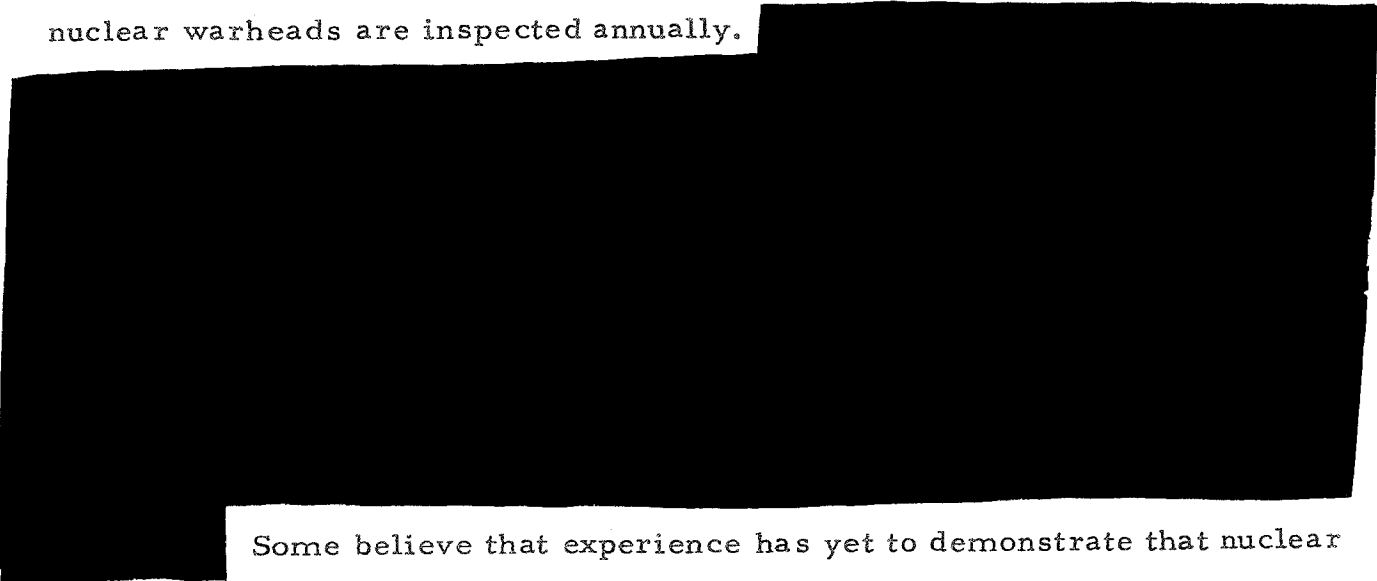


Under a CTB it would be impossible to search for further vulnerabilities using nuclear effects tests, and U.S. confidence in our systems could be reduced. Moreover, verification of the hardness of any new system designs could require nuclear testing.

Simulation techniques are not able to reproduce all of the effects of nuclear explosions nor are they expected to be able to do so in the future. While conceding this point, some believe that such techniques should provide us with sufficient confidence in systems using existing warheads, and note that the Soviets would also suffer any diminished confidence in their systems that might stem from relying solely on simulation. Others believe that

the contribution of our nuclear effects tests to assure the reliability of our systems is extremely important and that simulation will be inadequate to discover such complicated and subtle effects.

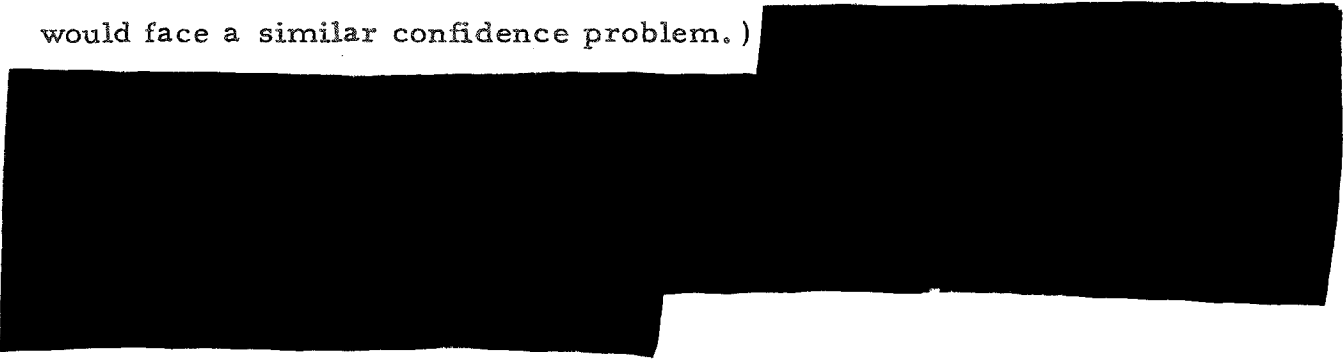
-- Confidence in some weapons in our nuclear stockpile could erode over time if defects are discovered which cannot be investigated or their fixes proven except by nuclear testing. Several hundred stockpiled nuclear warheads are inspected annually.



Some believe that experience has yet to demonstrate that nuclear testing of stockpile weapons for reliability verification is essential. Others believe that we should initiate periodic testing of weapons in the stockpile to maintain confidence as the stockpile ages.

Much of the real basis for the very high confidence in our stockpile is due in large measure to our development and test program. Some believe that it is important that we not lose the constant measure of confidence provided by our nuclear test program, which has continuously demonstrated the high reliability of the materials and design concepts reflected in the


stockpile. Others believe that our stockpile inspection program will remain adequate for maintaining stockpile confidence if testing is prohibited. They also believe that the U.S. strategic force is sufficiently large and diversified that any modest reduction in stockpile confidence would be of no overall strategic consequence. (Under a CTB the Soviets would face a similar confidence problem.)




-- Our nuclear weapons laboratories would be severely curtailed in their capability to advance nuclear weapons technology, and the competence of weapons design teams would soon deteriorate.* If it ever becomes necessary to resume testing and new weapons development after a CTB had been in effect for an extended period, it is estimated by the AEC that it could take 3 to 5 years to reestablish our currently extensive and mature nuclear weapons design competence, although any available experimental devices and stockpile weapons could be tested quite soon after testing resumed and some new weapons development could be undertaken.

* The AEC, JCS, and OSD representatives believe that the U.S. should not give up, through a CTB the freedom to continue nuclear testing because we would thereby lose a unique and important technical resource that has proven to be highly useful in continuously preserving the effectiveness and reliability of our deterrent.

While there would be some work available for our laboratories relevant to nuclear weapons, such as improvements in non-nuclear technology, and components, simulation research, and warhead adaptation, which would require the skills of some weapons designers and researchers, nevertheless, nuclear testing is a necessary ingredient for the advancement of nuclear weapons science. Soviet nuclear weapon scientists may be subject to different incentives to continue their research, but without nuclear testing the advancement of their technology eventually would reach its limit and thereafter their competence would also deteriorate from stagnation. They could, however, prolong the creative activity of their laboratories by risking some clandestine testing or by planning that, through treaty abrogation, these opportunities would be provided in the not distant future.



Some believe that this lead currently acts as a deterrent to third country aggression and proliferation (e.g., India , and that it is militarily unsound to consider a CTB which is not truly comprehensive, that is, one which does not eliminate nuclear testing by all countries.

Moreover, they believe that even without a CTB, continued advances in atmospheric nuclear testing by China could eventually create sufficient pressure on the Soviets to cause them to resume atmospheric testing. The ability to test underground has to date prevented this pressure from growing to such a point. It seems certain that under a CTB there would be justifiable pressures in the U.S. as well as in the USSR to resume testing if other countries were actively testing and building large nuclear arsenals to the point that our national security postures might be imperiled.

However, others believe that a CTB without Chinese adherence would not be detrimental to our national security, and that a widely-adhered-to CTB is expected to isolate China and France as the only testing countries, thereby increasing political pressure on them to stop testing eventually.

It is noted that the current U.S. and Soviet lead over China in nuclear weaponry is great, and that it would take many years and a massive effort for China to attain an equal posture, regardless of a CTB. Some believe that nuclear "superiority" is not attainable in any meaningful sense, and that this concept ignores the fact that a capability to inflict massive destruction sufficient for deterrence can be achieved with low levels of nuclear forces and technology.

NET ASSESSMENT OF STRATEGIC IMPACT

The impact that a CTB would have on the national security posture of the U.S. is affected by four major considerations:

- (1) How would a CTB affect attainment of U.S. strategic objectives?
- (2) To what degree would a CTB affect our capability to respond to future threats?
- (3) To what degree will SALT and a CTB constrain development of threats against U.S. forces?
- (4) Are there adequate responses to future threats that can be provided without nuclear testing.

There are sharp disagreements between agencies over the four major considerations above. These disagreements hinge over the uncertainties inherent in these issues.

Our current strategic objectives are stated in NSDM 16:

1. Maintain high confidence that our second strike capability is sufficient to deter an all-out surprise attack on our strategic forces.
2. Maintain forces to insure that the Soviet Union would have no incentive to strike the United States first in a crisis.
3. Maintain the capability to deny to the Soviet Union the ability to cause significantly more deaths and industrial damage in the United States in a nuclear war than they themselves would suffer.
4. Deploy defenses which limit damage from small attacks or accidental launches to a low level.

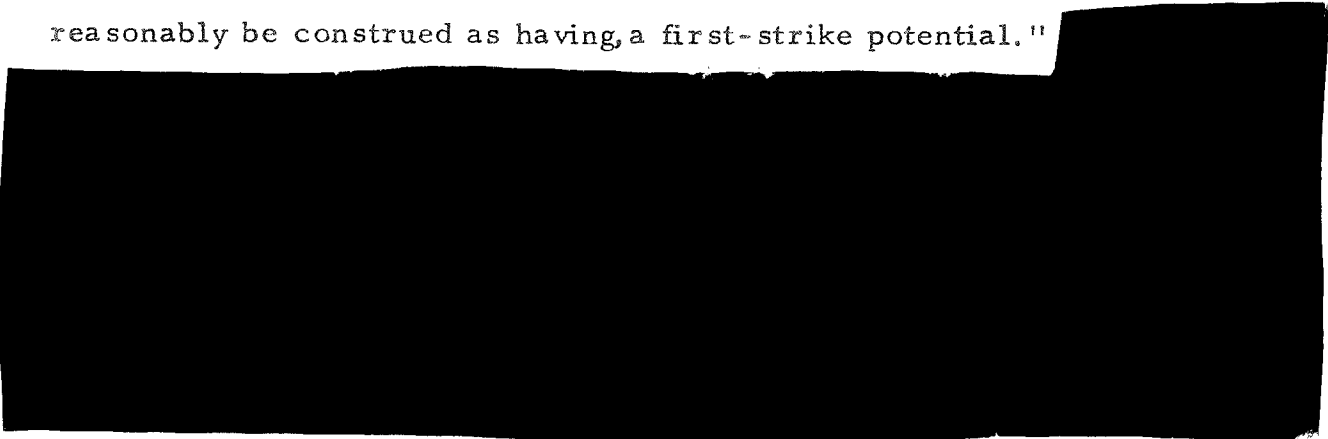
The President, in his foreign policy report to Congress on 9 February this year, reaffirmed the broad scope of U.S. strategic objectives when


he stated:

"A simple assured destruction doctrine does not meet our present requirements for a flexible range of strategic options. No President should be left with only one strategic course of action, particularly that of ordering the mass destruction of enemy civilians and facilities. Given the range of possible political-military situations which could conceivably confront us, our strategic policy should not be based solely on a capability of inflicting urban and industrial damage presumed to be beyond the level on adversary would accept."

These objectives and alternatives are under review by the DPRC.

Some believe that assured destruction remains the most essential component of strategic deterrence. They note that in a letter to Senator Brooke, on December 29, 1969, President Nixon stated that "the purpose of our strategic program is to maintain our deterrent, not to threaten any nation with a first strike..." Similarly, Secretary Laird in a November 5, 1970 letter to Senator Brooke stated that "we have not developed, and are not seeking to develop, a weapons system having, or which could reasonably be construed as having, a first-strike potential."



The following discussion considers the effect of a CTB insofar as it denies certain new strategic warhead options for 

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The detailed analysis upon which this assessment is based is at pages 51-81.

Assured Destruction

Under current NIE projected threats and force levels for this decade, analyses of strategic force exchange models indicate a CTB would make no appreciable difference to our -- or Soviet -- strategic retaliatory assured destruction deterrent capabilities compared to what could be achieved without test ban constraints. Moreover, the independent retaliatory capabilities of our SLBMs and ICBM-bomber forces would remain quite sufficient for assured destruction capabilities.

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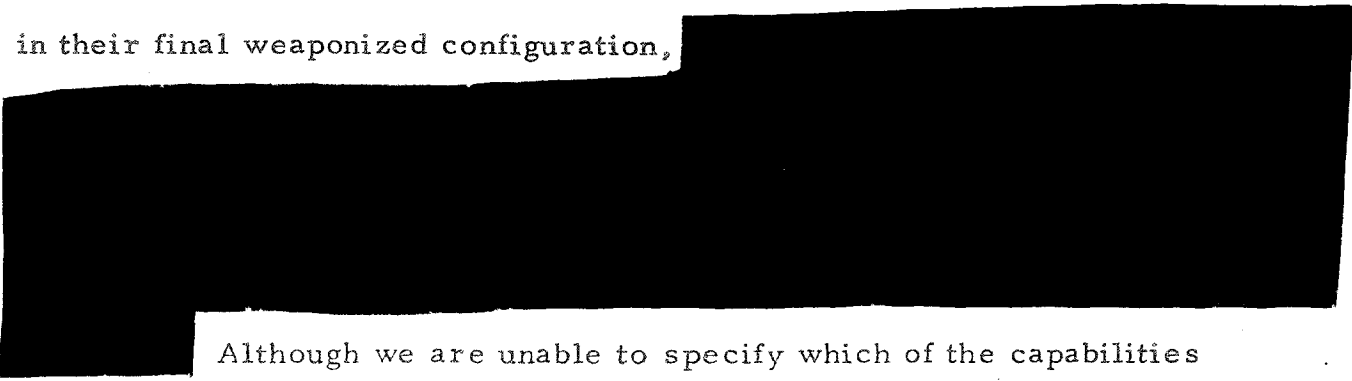
These conclusions are based on current threat estimates for this decade. The effect of new threats possible in the future is addressed below.

Future Threats

There is little doubt that under a CTB the Soviets probably could still install 3 to 6 MIRVs on the SS-9 class missile, using existing warheads. The possibilities for higher MIRV loadings under CTB constraints are questioned by some. While we have not seen Soviet warhead/RV combinations that would be suitable to MIRV the SS-11 and SS-NX-8, these may exist or may be available by the time a CTB went into effect. If not, a CTB could prevent MIRVing these missiles.

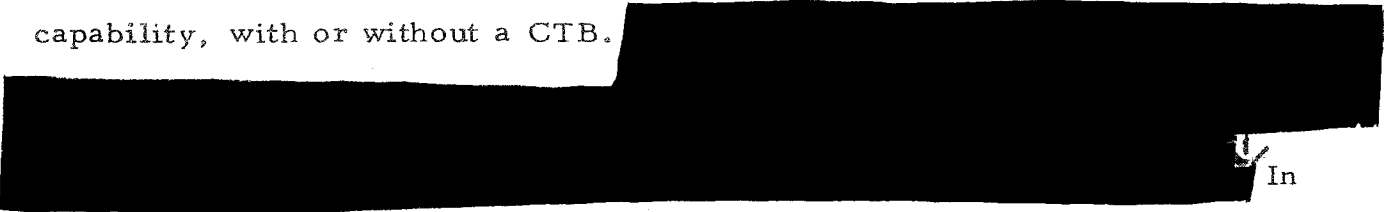
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The yields of warheads the Soviets could employ for MIRVing under a CTB would depend upon the extent of their experience prior to the conclusion of a CTB in developing high yield warheads in relatively low weights, on their willingness after a CTB is in effect to deploy warheads that have not been tested in their final weaponized configuration,



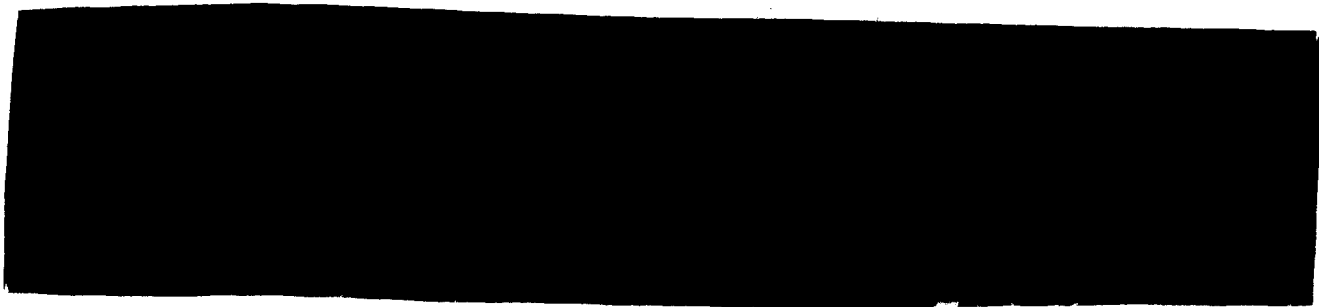
Although we are unable to specify which of the capabilities assumed for Soviet forces would be the more difficult to achieve under a CTB, it seems likely that an early CTB would constrain at least some Soviet strategic nuclear warhead capabilities to less than the maximums they could achieve with continued freedom to test.

Analysis suggests that even if all this MIRVing were accomplished, it would not make any difference to our -- or the Soviets -- overall assured destruction capability, with or without a CTB.

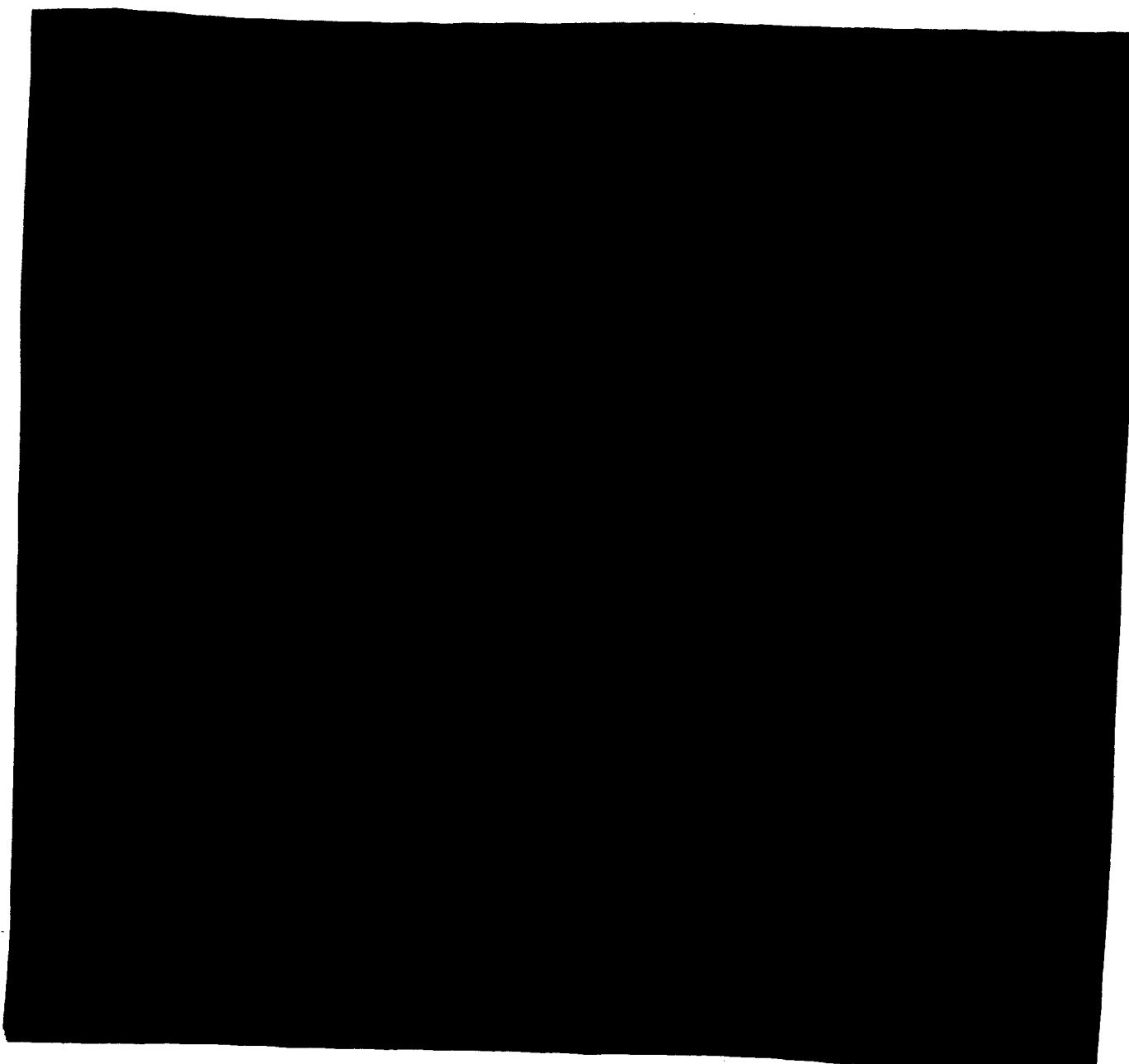


In this case, the whole weight of our retaliatory responses would fall on our SLBMs and bombers.

If a test ban constrained the Soviets from extensive MIRVing, there would be some increase in U.S. ICBM survivability.



Some believe that the time when MINUTEMAN could become highly vulnerable would be delayed by a CTB.



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A maneuvering RV (MaRV) for our SLBMs is postulated to overcome large scale deployments of ABM-capable SAMs that could negate an all-ballistic U.S. strategic deterrent.

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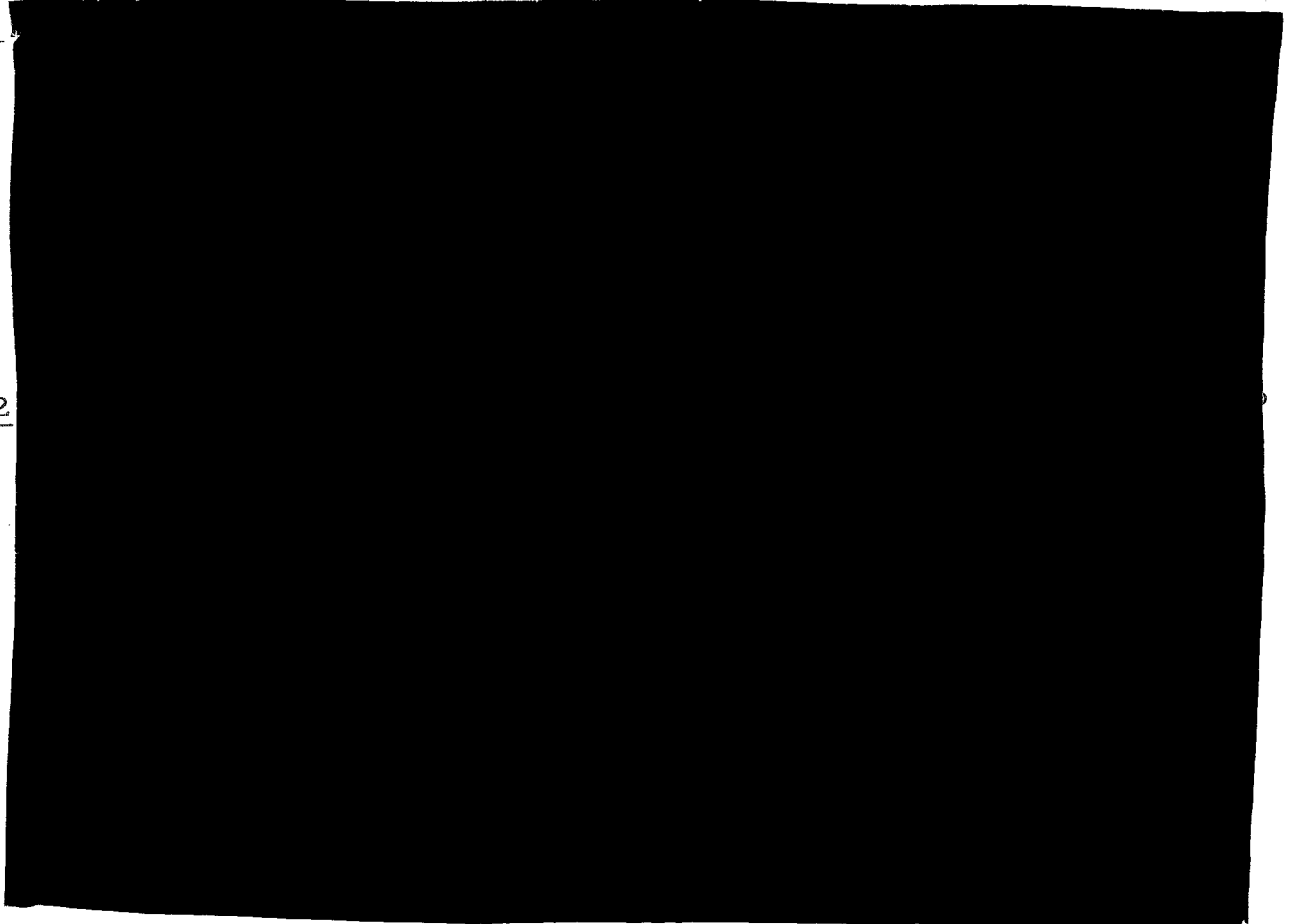
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Endo-atmospheric intercept ABM-capable SAMs are possible, as are exo-atmospheric interceptors. It appears that exo-atmospheric interceptors may be more likely to be inhibited by CTB constraints because of their very high yields, if suitable warheads are not already available.

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Development of endo-atmospheric interceptors may also be constrained by a CTB, if suitable lightweight warheads necessary for the high velocity and accereration required for endo-atmospheric intercept are not already available or would not be by the time a CTB went into effect.

Our SALT proposal is intended to prevent SAM-upgrade by prohibiting (1) testing in an ABM mode, (2) no territorial defense, (3) and upgrading radars, interceptors, and launchers to ABM capability. However, some believe that SALT will not effectively prohibit ABM-capable SAM systems. The Soviets have continued their refusal to accept meaningful controls on SAM radars. It would be difficult to verify that large phased-array radars ostensibly deployed as SAM radars did not have an inherent or actual ABM capability, and we have only limited ability to establish participation of specific radars in ABM tests. Further, they believe that the SALT agreement will not establish meaningful limitations on the performance of SAM interceptors.

Attack of Other  Targets



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[Pages 30-32 not declassified]

Tactical Modernization

Projected testing for new tactical nuclear weapons can be divided into three categories: (1) that necessary for warheads now in engineering development, (2) that which would apply to the development of further new warheads within the present state of the art, and (3) longer range investigations of advanced technology, [REDACTED]

Currently three tactical warheads are in engineering development. The warhead for the LANCE missile system is completed insofar as nuclear testing is concerned. On the other hand, the two new nuclear artillery rounds for the 155 mm and 8 inch howitzers each require some additional nuclear testing.

The present state of the art for nuclear weapons would permit some improvements in other tactical weapons. Such possible improvements include: warheads for air-to-surface missiles, such as CONDOR; new atomic demolition munitions with improved field handling features; earth penetrating warheads on surface to surface missiles; a warhead for a possible new surface-to-air missile; and warheads for naval applications.

To varying degrees these developments would profit from nuclear testing. Some fitting of current warheads to new and improved delivery systems could be done without nuclear testing. Optimization would generally require more nuclear testing.

Such developments as discussed above will not give U.S. forces totally new capabilities on the battlefield or at sea. Their import, to those who support tactical nuclear weapons options, lies primarily in their giving clear evidence as to the U.S. belief in the utility of such options. In their view, some modernization would thereby enhance the value of our tactical nuclear weapons in deterring potential enemies.

Beyond the present state of the art, nuclear testing might produce new types of weapons, [REDACTED]

[REDACTED] It is conceivable that some new weapon type could be of advantage to the U.S.

An issue of considerable uncertainty and controversy is the extent tactical nuclear stockpile modernization is essential to our national security.

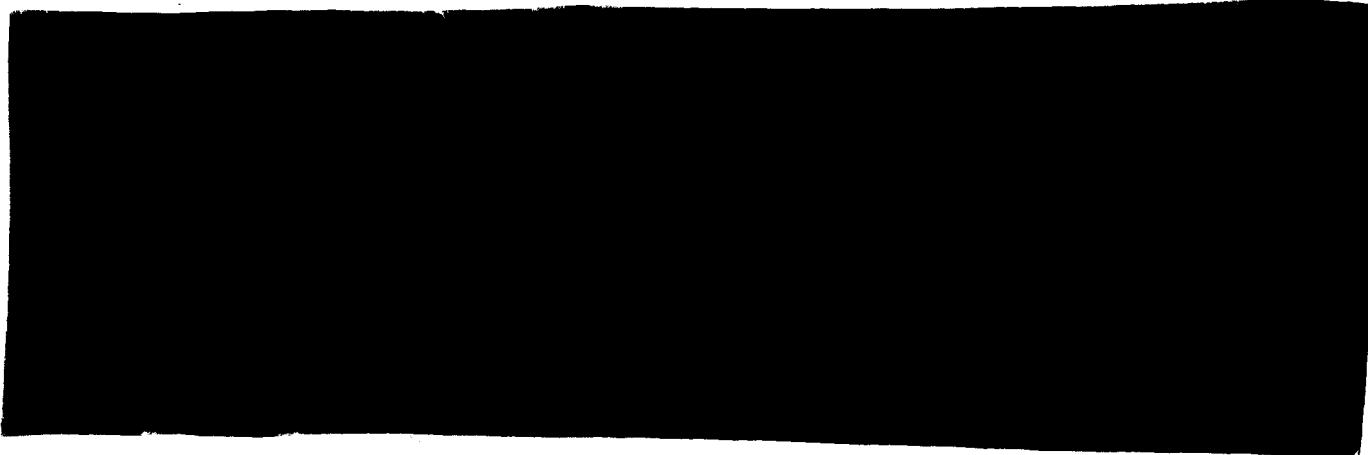
The support for tactical stockpile modernization is based on a conviction that constrained tactical nuclear warfare is an attractive option if the other alternatives are loss of a conventional war in Europe or mutual destruction of the United States and the Soviet Union.

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Although success is not certain, limited and selective use of a few battlefield nuclear weapons would seem to offer a possibility of halting a penetration that otherwise would overrun our forces, and thereby might cause the opponent to reconsider the payoff from his attack and, in fact, to withdraw.



The size, composition, quality and rationale for the tactical nuclear weapon stockpile are unresolved issues, as yet. Other studies within the NSC system are addressing these issues. It is argued by some that we should not make a decision to negotiate a CTB until the results of these studies are known. However, others question whether the results of these studies would materially affect a test ban decision.

A threshold test ban or quota limit would keep the tactical modernization option open.

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NET ASSESSMENT OF VERIFICATION ANALYSIS 1/

-- The public credibility of the U.S. case for insisting upon on-site inspection for verifying a CTB is under attack due to the advances in seismic and other national means technology. Moreover, there is decreasing confidence in the technical efficacy of on-site inspections in discovering clandestine testing by a determined evader, although they could -- under some circumstances -- provide the only incontrovertible evidence of a nuclear detonation. However, the political value of on-site inspections in achieving public acceptance of a CTB, for providing public confidence that violations are not occurring, and for possibly providing some measure of deterrence should be noted. How many and what type (invitational or mandatory) OSIs would be necessary for these purposes has not been determined. The modalities of conducting useful OSI present many problems that would require difficult negotiations to overcome. The contributions of OSIs to detection of possible test ban violations is likely to be modest when compared to the contribution of other verification means available to us. Invitational inspections, as recently proposed in Geneva, are of dubious utility, could contribute to international tension if refused, and are not likely to be granted except on terms calculated to exonerate the evader.

1/ The supporting analysis is on page 82 - 106.

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-- If the U.S. genuinely wants a CTB, we will have to be prepared to rely upon national means of verification. These sources may be supplemented, if possible, by such OSIs, unmanned seismic observatories, an international seismic network or some form of "nuclear detection club" as might be obtained in negotiations. 1/

-- Improvements in the U.S. AEDS system are attainable and would increase U.S. internal confidence in verifying a CTB. These improvements would cost around \$20 million. We should also consider deploying other sensors in space and under water.



(Magnitude 4.0 is about the lowest limit of feasible seismic discrimination with improved AEDS. The actual capability achieved would have to await

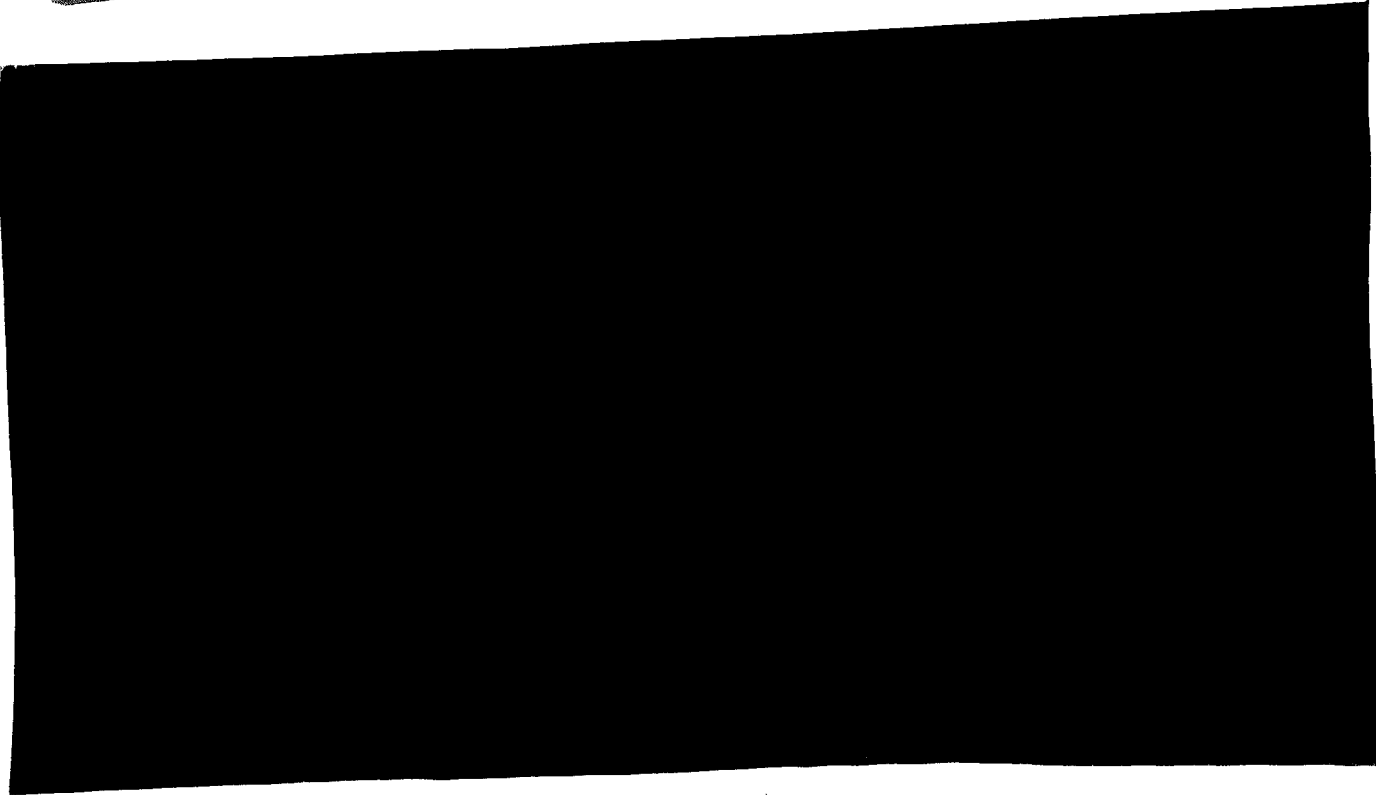
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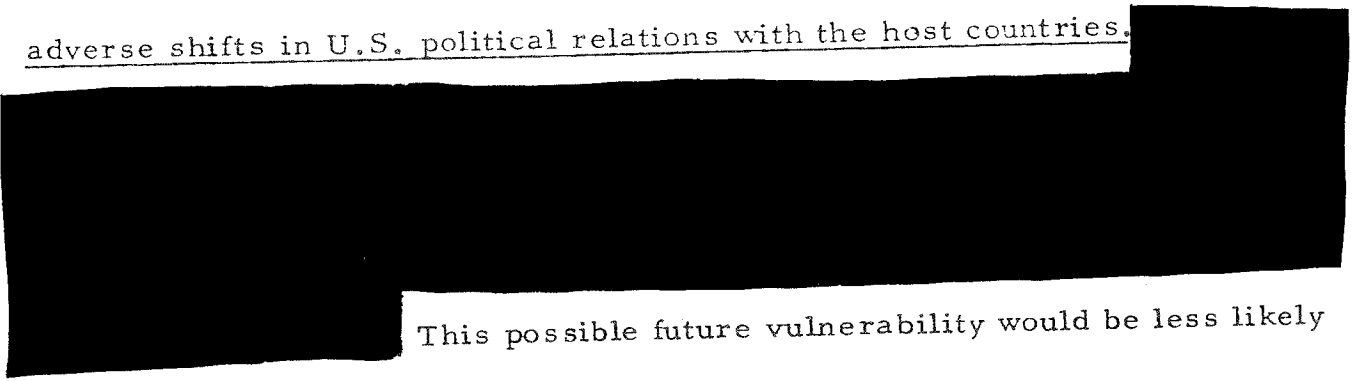
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-- Some of our AEDS stations could become vulnerable to adverse shifts in U.S. political relations with the host countries.



This possible future vulnerability would be less likely if the host were a party to a CTB treaty and had an interest in treaty verification.

-- Some clandestine underground nuclear testing would still be possible that could evade identification by national means including improved AEDS.

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1)

[REDACTED]

some tactical weapons development, and some nuclear effects testing could be conducted. It also may be possible to develop a SAM-upgrade warhead.

2)

[REDACTED]

It is not known whether the Soviets have perfected these techniques.

If these techniques were used successfully, and depending on yields and rate of testing, a variety of nuclear tests could be conducted including probably all types of nuclear effects tests and the development of tactical weapons, warheads for ABM-capable SAMs and warheads for Poseidon-class MIRVs. There are no theoretical techniques known that would permit evasive underground testing [REDACTED]

3) None of these clandestine testing techniques is foolproof and all have risk of detection by the composite of our national means. This risk increases with yield, [REDACTED]

4) At the present time opportunities would exist for higher yield testing in environments prohibited by the LTBT (e.g., behind planets in outer space or low over Antarctica) The technology is available to detect such testing, but funding of the systems is required.

-- Seismic systems other than AEDS are possible which could provide high confidence identification [REDACTED]

1) A high quality unclassified international seismic network could be deployed in 3-5 years at a cost of \$60-\$160 million, depending on coverage and sophistication desired. [REDACTED]

2) [REDACTED]

[REDACTED] Further work is required to develop satisfactory USOs.

Even if the USOs were acceptable to the Soviets, negotiating the necessary modalities could be difficult and protracted.

-- International means of verification could strengthen our ability to present a charge of violation, if the internationally derived data supported such accusations. Moreover, international means could enhance deterrence

of violations and provide public confidence in test ban enforcement.

Nevertheless, these international means would not be essential to our diplomacy in bringing credible charges of test ban violation.

-- Some international means of CTB verification would be difficult to negotiate and administer. The modalities are complex.

[REDACTED] Furthermore,

the U.S. probably cannot afford to place primary reliance upon such international schemes as a substitute for national capabilities.

-- Reliance upon seismic data alone to support public charges of test ban violation could be difficult due to the complexity of the data, the interpretation required and the fact that unresolvable ambiguities may occur.

-- If we undertake a CTB, we shall have to consider how we will handle any suspected violations both diplomatically and publicly. There are two aspects to this problem. First, where confirmatory evidence of a violation depends on sources more highly classified than AEDS, means would have to be found to justify our public position that do not compromise important intelligence sources. Second, choices would have to be made among responses open to us ranging from protests, public

or private, to treaty abrogation. Our response will have to depend on the political situation, the evidence available, the source of the data and our political objectives under the circumstances.

-- Any type of further test ban will necessarily require that Peaceful Nuclear Explosions (PNEs) either be subjected to comprehensive safeguards to prevent clandestine nuclear weapons testing or be prohibited.

These safeguard are all complex and highly intrusive, and thus may be very difficult to negotiate. Prohibiting PNEs may not be acceptable to the Soviets. Peaceful Nuclear Explosions present a formidable verification problem and possible political problems which are discussed in the section that follows.

Peaceful Nuclear Explosions

It is not known how much importance the Soviets attach to retaining their PNE capability under a CTB, but they have been pursuing their PNE program at a rate approximately three times that of the U.S. and have announced that they have refined four applications to practical use. In the U.S., PNEs have not yet attained commercial applications, though the technology is available for several uses of economic potential. Under the Non-Proliferation Treaty the nuclear powers are committed to share the benefits of PNEs with non-nuclear weapons states (NNWS)

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if and when PNEs become economically practical. So far, no such services have been provided. It is not known whether the NNWS would sacrifice PNEs to attain a CTB or insist that PNEs be accommodated under a CTB. If PNEs were prohibited, some near-nuclear states might refuse to join a CTB under this pretext (e.g., India). Others, however, might favor banning PNEs if they prove to be a basic impediment to a test b

Technically feasible means of accommodating PNEs have been postulated that would severely inhibit PNE use for clandestine nuclear weapon testing. Without these safeguards, it would be possible to conduct nuclear weapons related testing in the course of PNE detonations. However, these safeguards probably would be very difficult to negotiate since they involve comprehensive international controls and substantial access to national territory and the release of classified nuclear design information. Without effective safeguards, PNEs would have to be prohibited to achieve a CTB or TTB. Conversely, if the Soviets were adamant on continuing their PNE program, such safeguards would be essential to a CTB or TTB.

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Policy Options

1. Maintain the status quo commitment to eventually achieving a CTB, but continue to insist upon on-site inspections.

-- Our declaratory policy on verification will be construed as a measure of our desire to achieve a CTB. Any shift from the status quo position, including on-site inspection, is likely to be interpreted as a move toward or away from a CTB, depending on specifics.

-- As long as the U.S. maintains this position and the Soviets maintain that national means of verification alone are adequate, the net effect will be an impasse and underground nuclear testing can continue. However, we can expect to incur increasing criticism from domestic and international proponents of a CTB if the present U.S.-Soviet verification impasse continues to come under greater challenge. At present, the U.S. bears most of the political onus for lack of a CTB, since the Soviets have the advantage of advocating national means only for verification and this position is gathering public support. However, some states blame both the U.S. and USSR for failure to negotiate a CTB. Environmentalists may protest and possibly harass some future tests through court actions. Our non-proliferation objectives would not be reinforced. (Some believe that these objectives would be jeopardized. Others believe that the impact of continued testing would be marginal on NPT objectives.) The credibility of our position is likely to be attacked, especially as seismic discrimination technology advances. On the other hand, we have been

able to successfully defend our verification position including on-site inspection for many years, and some believe that we can continue to do so for some time yet.

-- If the Soviets take new initiatives and advocate alternatives to OSIs for verification (egs., USOs or "nuclear detection club"), we would come under pressure to respond favorably. We have no firm evidence that the Soviets are planning new initiatives now.

-- If the Soviets unexpectedly agree to a few OSIs (e.g., 2-3), we will have to face squarely the question of the desirability of a CTB and decide either to negotiate or hold out for a larger number of OSIs.

2. We could attempt to shift the debate away from verification to national security grounds without abandoning our commitment to a CTB by advancing reasons to contend that a CTB is not desirable at this time, if credible reasons can be devised. We could raise new considerations such as awaiting long-term SALT outcomes, evaluation of future threats, MBFR, and thereby prolong and complicate the status quo. There is disagreement about the political feasibility of this approach.

3. Propose a pre-condition that all nuclear weapon states participate in a CTB. This proposal would be viewed as aimed at China even though applicable to France, too. This option could be advanced with or without a change in our position on verification. There is a high likelihood that China (and perhaps France) would not join a CTB. Thus, this pre-condition would preclude a CTB in the foreseeable future. It could shift the grounds

of public debate away from verification to the issue of the necessity of participation by all the nuclear weapon states. There is disagreement as to whether this option could be publicly defended.

4. Accept national means only for verification of a CTB and offer to negotiate an agreement.

This would put the choice and political pressure for proceeding with negotiations directly on the Soviets. We do not know if the Soviets really want a CTB agreement. If the Soviets did not want to negotiate, they would have to find a reason to defer or obstruct negotiations and persuade the international test ban constituency that they still favor a CTB as a goal. However, many would interpret such a Soviet response as a renunciation of their commitment to a CTB.

5. Drop mandatory OSIs and propose other sources of data to supplement our basic reliance on national means of verification (egs., USOs, international seismic networks). Such internationally derived data could also give public confidence in test ban enforcement as well as provide a public basis for any charges of violation. It would represent a new U.S. initiative that would broaden the verification issue, but release the U.S. from being confined to a simple OSI versus national-means-only confrontation with the Soviets. If the proposal is acceptable to the Soviets, then we would be expected to enter negotiations. However, negotiations of the modalities could be protracted and difficult.

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6. Propose a seismic threshold test ban of [REDACTED] The threshold selected would depend upon the level of testing we deem it in our interest to prevent -- and permit. We have the national means to verify the levels indicated adequately. Our requirement for on-site inspections would have to be dropped or else reduced to a very low number. Failure to drop OSI could lead to the continuation of the current impasse over verification. National verification capabilities are very good for the level indicated and anomalous seismic events above this threshold are so rare that clandestine testing would be very risky. However, a TTB is likely to be viewed as an interim measure and the expectation would remain that a CTB is the eventual goal, although some states would accept a TTB as progress toward a CTB. It probably would be difficult to abandon a CTB as our ultimate objective, although a TTB would likely defer a CTB to a distant future. However, a TTB offers a means to approach a CTB gradually over time by providing for periodic lowering of the threshold or periodic reviews for this purpose, as operational seismic verification capability improves. (The Japanese have tabled just such a proposal, beginning at magnitude 5.75 and eventually descending to magnitude 4.25 -- using an international seismic network for verification.) In this way we could maintain our commitment to a CTB yet continue testing in the lower yields probably for some years. E the pressures to reduce the threshold over time and move toward [REDACTED] [REDACTED] for a CTB would be strong.

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A TTB would keep open the option to develop new nuclear weapons. The types of weapons would depend upon the threshold limit. For the thresholds indicated, we could continue to develop some strategic and many types of tactical warheads, continue technology advancement, investigate nuclear effects and provide a means for stockpile surveillance.

The general political response to a TTB would be favorable, but substantially less than to a CTB. The potential for realizing the possible political benefits postulated under a CTB probably would be substantially less under a TTB. Some would perceive a TTB as a step toward a CTB, but others would view it as a tactic to delay a CTB. The Japanese, Canadians, those concerned with environmental effects, and others with an interest in preventing high yield tests have expressed interest in such a TTB. A TTB would not reinforce our non-proliferation objectives as much as a CTB, although there is disagreement over the extent a test ban reinforces non-proliferation. Under a ~~TOP SECRET / RESTRICTED~~ TTB, economic applications of PNEs would be precluded unless accommodations and safeguards were provided.

The modalities of negotiating the technical definition of the threshold could be difficult, and implementation could become a source of political controversy concerning alleged violations since disputes could arise over the interpretation of seismic data. Indeed, perhaps unintentional violations could occur since the yields of nuclear tests are not precisely predictable.

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Moreover, seismic data does vary somewhat from station to station due to variation in station quality, location, geology, etc. These possible violations and disputes probably could be avoided if testing states confined themselves to testing at predicted yields some 30% or more below the theoretical maximum permitted by the threshold. Geological asymmetries might permit the U.S. to test at somewhat higher yields than the Soviets under the seismic threshold. In the past, the Soviets have rejected the idea of a TTB.

7. Propose a 4.0 seismic threshold test ban. This threshold would have most of the effects of a CTB. However, it would permit the Soviets -- and U.S. -- to test at those very low yields

[REDACTED]

However, this threshold would still be vulnerable to violation by such clandestine testing techniques as earthquake masking or simulation. The other difficulties of a TTB cited above would also apply.

8. Propose some form of quota test limit. There are several variants: numerical quota, annual yield quota, cumulative seismic magnitude quota, a combination of threshold and quota. These options would retain the opportunity to continue nuclear testing for those purposes a state would

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choose within the limits of the quota. There would remain pressures to reduce the quota in order to achieve an eventual CTB. All of these variants have the common defect of being essentially unverifiable, except within broad limits of great elasticity and uncertainty (egs., multiple devices detonated simultaneously probably would be detected as only one test event; translating detected seismic magnitude into nuclear yields requires accurate knowledge of geological coupling media and closely corroborative seismic data -- magnitude [REDACTED] and could be a subject of controversy). This option would be only a loosely constraining and strictly unenforceable limitation.

9. Propose a moratorium. Variants include a unilateral undertaking to cease testing as long as the Soviets do not test, or else as a measure to preclude testing while negotiating a test ban agreement. There has been some recent Congressional interest in a moratorium. The longer a moratorium lasts, the more like a CTB it becomes. A moratorium could help create a favorable political atmosphere for test ban negotiations. On the other hand, a moratorium might remove a sense of urgency to negotiate a test ban. It could prejudice the possibility of negotiating other conditions for verification than national means only. A moratorium

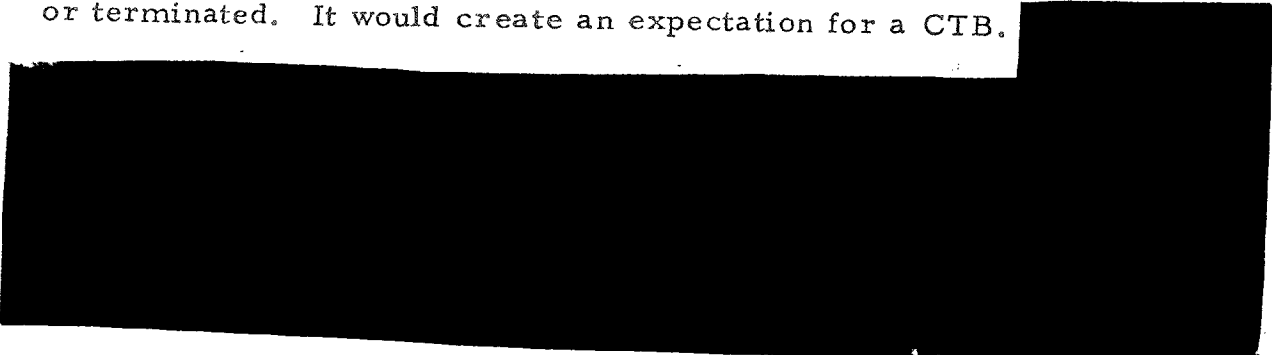
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would be an uneasy respite, and a cause for political tension if broken or terminated. It would create an expectation for a CTB.



[Omitted here are Annex A and Annex B.]